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U.S. NAVY

approach

How Far Should a Student "Get Involved"?

By Lt. Jay Hudson

IT was a zero dark thirty brief for an ACM hop in the training command. Only two more flights until we got our wings, and the training officer knew it. He had been really pouring it on both the students and instructors for the past couple of weeks, because the squadron was behind in production and he was playing catch-up. As I drove in for the brief, the rain was coming down in sheets and my thoughts were "Oh no, another brief with a cancellation due to weather."

The section brief covered all the main points. However, it was not too clear what our "knock it off" fuel level was to be. The section manned up as a flight, but as lead, I called for individual takeoffs. The weather had improved to circling mins and the rain had stopped. I was to take off and check the weather. If it was OK, Dash-2 would join up with us in the local MOA. Takeoff went fine, and the clouds only went from 1,200 to 6,000 feet, with a perfect blue sky above. Dash-2 joined up quickly and the fight was on.

After five runs (one more than briefed), we decided to head home. The lead had been passed to the other aircraft. The weather precluded a section approach, so the flight split up to take individual GCAs. As Dash-2, we were told to hold for three turns while they brought the lead down. After two turns I noticed that our fuel quantity still permitted a Bingo to Southwest AFB, the only airfield in the area reporting reasonable weather, but we had to commence right away.

I discussed this fact with my instructor pilot; he felt that there should be no problem getting into home plate, and METRO was calling the ceiling at 700 feet.

Approach was apparently having problems, because at this point our holding was extending to six turns. Finally, we were given vectors for the GCA box pattern.

The instrument approach went flawlessly. Approach was handling the situation calmly; we had three down-and-locked, and had discussed using the long-field arresting gear if the runway was wet. The only problem was that we didn't break out at minimums and had to execute a missed approach.

Now both of us got a little nervous and I checked again with METRO for a divert while we were on an extended downwind. There was no divert available due to weather except Southwest AFB, and now we didn't have the gas to get there.

The second approach was executed with the pilot and myself both scanning the instruments, with one or two peeks outside. No luck. Missed approach again. Declaring emergency fuel got everyone's attention, and we were turned in early. This approach was pushed to absolute minimums, and we were rewarded with the flashing runway strobes. A safe landing was accomplished with engine shutdown quickly thereafter. The fuel remaining would not have taken us around again. Heavy sighs of relief echoed over the ICS.

Two major problems contributed to this near mishap. First, we didn't fly what we briefed. The extra run put us at a fuel-critical point when we left the MOA. Our wingman had considerably more fuel since we had launched early to act as the weather recce. A second factor was a failure on our part to query approach about the actual weather being reported by the aircraft attempting to land. We should have realized something was wrong when we had to hold for the extra turns.

As a student, I felt a little hesitant about pointing out Bingo fuel criteria to a fleet pilot. In the debrief, he admitted that my timidly-put suggestion to divert to Southwest AFB hadn't been seriously considered. I feel that had I pushed the issue, we might have saved ourselves a few gray hairs. This applies in the fleet, too. If the nugget recognizes an unsafe situation, he should not hesitate to point out the options available to the "old salt." Everybody has their lives on the line in the air.

Lt. Hudson is the electronic warfare officer for the VAQ 134 Garudas, flying EA-6Bs.

inside approach

U.S. Marine AV-8Bs. (Drawing by McDonnell Douglas artist R.G. Smith.)

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FEATURES

DEPARTMENTS

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VDPs and Pilot Longevity

By LCdr. Andrew J. Peck

"DO you use VDPs when you're flying, Lieutenant?"

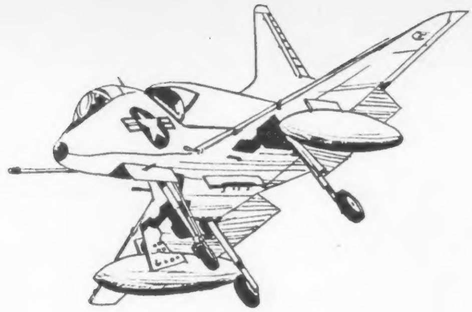
"No, sir. I don't even use aspirin without the flight surgeon's OK."

If this lieutenant is hoping to keep his name out of the newspaper, he should familiarize himself with Visual Descent Points. The number of instrument approaches that incorporate them is steadily increasing.

VDPs are shown on approach plates by heavy "V" symbols. In a nutshell, they represent a defined point on a straight-in, non-precision approach at which an aircraft operating at the Minimum Descent Altitude (MDA) should begin "normal" rate of descent to the touchdown point (usually considered to be 1,000 feet from the threshold). Of course, this applies only if the necessary visual references are established. VDPs will normally be associated with a VASI (Visual Approach Slope Indicator) — either the traditional red-and-white type or perhaps an optical landing system (OLS) at a Navy base. VDPs are defined by DME fixes or airway beacons. The latter will illuminate the white beacon light if your aircraft is so equipped. Most Navy aircraft will have only one beacon light (none if the aircraft does not have a VOR).

VDPs were developed because pilots flying straight-in approaches had no guide to show when they should descend from the MDA, assuming that the legal criteria for descent were met (i.e., runway or lights in sight and aircraft positioned for a safe landing). The problem is most severe at night or in marginal weather because of optical illusions and a lack of good visual height and distance references. If the descent is initiated late, a steep descent angle and high sink rate is required, resulting in a potentially dangerous situation. If the descent from the MDA is initiated early, the shallow descent angle may not provide adequate obstruction clearance.

The FAA considers anything from 300 to 400 feet per mile to be a "normal" descent gradient; 300 feet/mile (a 3^0 glide slope) is considered ideal. A ground speed of 140 knots requires a descent rate of 740 feet per minute to remain on a 3^0 glide slope. For approaches to runways equipped with a VASI, the VDP will be at the point where the lowest VASI glide slope intercepts the lowest MDA. Where a VASI is not installed, the VDP will be located at the point where a descent gradient of 300-400 feet/mile from the MDA to the threshold commences. If you're having difficulty visualizing all of this, figure 1 may help.



Obstacle Clearance Guarantees. With a VASI, you are guaranteed obstacle clearance within 10^0 of the runway centerline if you're on the glide slope. For you technical types, the obstacle clearance plane is 1^0 lower than the aiming angle of the downwind VASI bar. Without a VASI, you are guaranteed obstacle clearance above an angle which is $1\frac{1}{2}^0$ below the angle resulting from the descent gradient from the VDP to the runway threshold.

How To Use VDPs. If the weather is decent and you want to give the crew a nice ride, fly as you normally do for a smooth, stable descent.

If you're practicing, or if the weather is marginal, you should be at the MDA well before reaching the VDP. This will give you the best chance of acquiring the necessary visual references if the ceiling is ragged or scud is present, which may require maneuvering to keep the airport in sight. A 1,000 fpm descent rate from the Final Approach Fix is usually adequate to accomplish this.

Level off at the MDA, being careful to avoid airspeed decay. If you're the "Ace of the Base" you claim to be, you should know the power setting necessary to maintain altitude at your approach airspeed and configuration. If you're not the

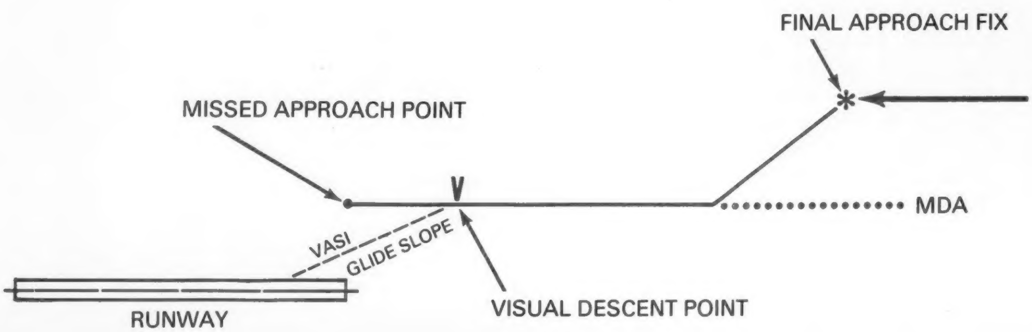


Figure 1

If you're practicing, or if the weather is marginal, you should be at the MDA well before reaching the VDP. This will give you the best chance of acquiring the necessary visual references if the ceiling is ragged or scud is present.

AOB, experiment a little on your next flight. It may keep your name out of the 11 o'clock news some dark, windy night.

At the VDP, reduce power to that required for a normal PAR approach. If you're not sure of that power setting, re-read the last paragraph. Begin a descent rate of five times your ground speed (or half of 10 times your ground speed), adjusting power to remain on the VASI glide slope at the appropriate speed. Example: approach speed is 140 knots true and the estimated head wind at the approach altitude is 20 knots; your descent rate should be approximately 600 fpm.

If no VDP is provided for the approach, you can compute your own. Determine the height above touchdown of the MDA (from the minima block of the approach plate). Divide that number by 300 to obtain the number of miles from touchdown that a normal descent should be initiated. Study the approach plate to find a means for determining when you are at that distance from touchdown (e.g., if a TACAN is located at midfield on a standard 8,000-foot Navy runway, add 0.6 nm to the above number to obtain your own do-it-yourself VDP).

Legal Considerations. For approaches which specify a VDP, OPNAVINST 3710.7L now states that you may not descend below the MDA until reaching the VDP. Part 91 of the Federal Aviation Regulations has had this same restriction for years.

Examples. If you don't remember seeing any of those cute little "V" symbols on approach plates, check out the TACAN 13 and 25 approaches for NAS Whidbey Island, Wash., and all of the approaches for McChord AFB, Wash. Whidbey uses an OLS for visual guidance, while McChord uses a standard red-and-white VASI.

Is It Worth It? Before you decide that VDPs are for sissies or that a do-it-yourself VDP isn't worth the trouble, consider this: the refraction error caused by water on the windshield can be as much as 5°, causing you to appear higher than you really are. Runway slope can compound the illusion. In 1973, an airline DC-9 crashed short of the runway in a heavy nighttime rainstorm. This happened after the autopilot was disengaged at the middle marker (2,500 to 3,000 feet from the threshold), following a coupled, stabilized approach with the ILS needles centered and the aircraft in trim. The captain continued the approach by visual references. He later stated that the runway appeared normal but suddenly "flattened out in the blink of an eye." The aircraft struck the approach lights despite last-minute corrective action.

While this example represents an extreme case, if you peruse past issues of Approach or the Weekly Summary, you will quickly realize that the world of visual illusions has a number of "gotchas" just waiting to bite you. VDPs offer the professional aviator one more item in the bag of tricks used to keep his or her aircraft from touching the ground in an untimely fashion.

Bibliography. Remember your college days, when the professor handed out a bibliography for those interested in further academic pursuit of the topic? Here's mine. You'll find information related to using VDPs in "Ya Can't Fly Without Gouge" (Approach, December 1984). If you'd like to obtain the FAA Advisory Circular on VDPs (AC 90-70), ask an FAA office for information or refer to "If the Navy Wanted You to Have One, the Navy Would Have Issued You One" (Approach, September 1985). "Minimum Approach Scan" (Approach, November 1984) has an excellent discussion of the visual aspects of continuing an approach beyond the MDA/DH.

LCdr. Peck is a P-3 plane commander in the reserves and an F-27 captain for Horizon Air, after seven years of active duty flying helicopters and C-1s. In addition to holding an ATP and five type ratings, he is a certificated flight instructor with single- and multiengine land and instrument ratings. He also holds advanced and instrument ground instructor certificates and a commercial certificate for single-engine land aircraft and helicopters.

Which Flight Instruments Do You Believe?

By LCdr. R.L. Collier

WELL, I hope you believe them all. However, in the case of altimeters, you have two that give you height above the ground. What happens when they don't agree?

During a recent discussion in the wardroom, it became clear to me that many pilots (particularily the younger ones) thought of the radar altimeter as a piece of junk, and not worth scanning. This was due in part to differences between what was displayed on the radar altimeter and that on the baro.

Many of the pilots had this to say: "I set my baro to 60 feet before I take off and when I land, it's back at 60 feet, so it must be correct." When flying below 1,000 feet, particularly on Case I and II departures and final approaches, there are differences of 100 to 200 feet between the two altimeters. Which one do you believe? In order to answer that question, consider the following points:

- The radar altimeter operates in a manner similar to an airborne radar by transmitting a pulse of energy toward the surface, timing the return energy and calculating distance in feet.
- The radar altimeter has the following tolerances:

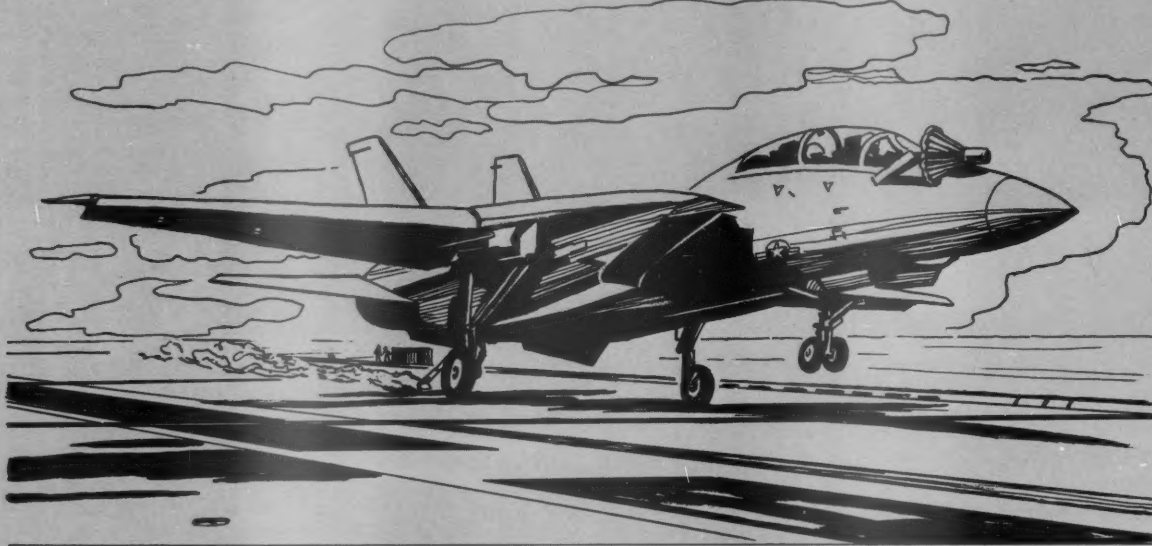
Altitude in feet	Error in feet
10	+/-1
200	+/-10
400	+/-12
1,000	+/-40
3,000	+/-120
5,000	+/-200

- The radar altimeter has internal bit circuits that ensure altitudes are displayed with these tolerances, or else there is no display at all. "What you see is what you get."
- The information displayed on the radar altimeter is instantaneous with zero lag.
- A low-altitude tone warns you when descending through a preset altitude.
- Zero to 500 feet covers one-half of the instrument face with zero to 100 feet covering the first quarter of that. At the important altitudes, those close to the surface, you have the most accurate display of altitude.
- The radar altimeter gives instant feedback as to the distance between your aircraft and what's immediately below. This presents problems over land with changes in terrain. Do you have to worry about changes in water level or obstructions at sea?
- Federal Aviation Administration Regulations, Part 135, requires air carriers to have an operable radar altimeter before attempting Category III approaches. (Those are the ones that have *no decision height.*) Which instrument do they believe in?

I'm not saying to ignore that baro with the altimeter setting and all. That instrument is obviously required as much as any that we have in our cockpits. However, at the critical altitudes, i.e., those close to the surface, we have been provided with a much more accurate and reliable instrument. If it's not in your scan below 1,000 feet, you're cheating yourself.

Decision height never changes at sea. At least we have one advantage on those dark, scary nights. If it's good enough for the FAA to require airline pilots to use, it's good enough for me. Think about it. If the radar altimeter puts you at 500 feet on the departure and the baro says 350 feet, which one do you believe? Are you at 650 feet or are you at 500 feet? It could make a difference to the 800-foot break traffic or the 600-foot downwind traffic.

LCdr. Collier is currently an instructor pilot with VF 101, having recently completed a Western Pacific Indian Ocean deployment aboard USS *Constellation* (CV 64) as an F-14 pilot with the Freelancers of VF 21.



D-704 In-flight Refueling Problems. The F-14 rendezvoused with the tanker-configured A-6E following a CV AAWEX mission. After drogue extension, the tanker cleared the Tomcat in. The fighter crew observed the amber light on the centerline D-704 refueling store and approached the basket. After two initial attempts, which proved to be wide to the left with no contact, the probe engaged the basket dead center.

The hose bowed slightly down and then snapped back up, separating from the basket assembly, which remained attached to the F-14's IFR probe. The aircraft recovered uneventfully aboard the ship.

Inspection revealed the F-14's probe nozzle to be sheared in half. The tanker guillotined the hose and diverted to a shore facility. Post-flight inspection revealed a shorted retract solenoid selector valve of the D-704. The safety wire connecting the hose to the basket was also broken. Inadequate response by the refueling store's take-up reel at IFR probe contact imparted a whipping motion to the hose which caused a severe strain on the wire, breaking it. Thus, the hose and basket were allowed to separate. The commanding officer's comments were, in part: " . . . this aircrew was extremely fortunate to incur only minor damage to the F-14's IFR probe nozzle . . . the D-704 has proven less reliable and is more demanding of the refueling aircrew than the KA-6D internal IFR system. The critical points in the D-704 system are in take-up reel response and the hose/basket attaching safety wire. Concerted efforts by maintenance personnel and diligence by aircrews in IFR procedures are the keys in ensuring the integrity of [the wing's] D-704 assets . . ."

The D-704 is a "tired" piece of gear which continues to be called upon in present operations and mission scenarios. To keep it working requires strict adherence to established maintenance and operational procedures, and the training to apply those procedures. The tanking mission is too critical to let the D-704 assume a fly-to-failure mode; it must be treated as any other aircraft system, with a little extra "TLC." This applies to receiver aircraft as well as the tanking squadrons. Utilization of a tanker is sometimes the last step before utilization of the ejection seat. — LCdr. R.R. Ayres, A-6 analyst, Naval Safety Center.

Corsair Gear Up, Flaps Up at Night. Returning from a night CQ, the A-7 pilot experienced a PC-2 hydraulic failure. Arriving over his home field, he dropped the hook and prepared to extend the landing gear and flaps by the emergency method. However, the gear would not extend, and application of positive and negative "G" had no effect. He decided to extend the flaps to reduce airspeed for an anticipated gear-up landing, but the flaps would not extend. A visual inspection by two other aircraft confirmed that

the A-7 was clean.

On the downwind, the pilot told the tower he wanted to perform a practice approach, but as he was making this transmission, he experienced a PC-3 failure. Now with two of his three hydraulic systems failed, there was little choice. He concentrated on the approach and flew a night gear-up, flaps up approach and landing, which resulted in minimum damage to the aircraft.

Post-mishap investigation revealed that although the pilot had performed a proper preflight, two subsequent actions by maintenance personnel led to this mishap. A bad decision by the flight deck coordinator released the aircraft for a one-time flight to the beach, with a PC-2 hydraulic leak in excess of prescribed limits. Also, emergency accumulators were improperly charged by a plane captain using incorrect procedures. Only the skill of the pilot prevented more serious damage. — Cdr. G.P. Mulvany, A-7 analyst, Naval Safety Center.

Olé! Can You See? IMC Approach in a P-3. During a night mission on deployment, the P-3 flight engineer saw the No. 2 engine chip light flicker. The patrol plane commander (PPC) ordered the engine shut down. After considering the emergency aspects of the situation, and the distance to a divert field on the mainland, the crew decided to return to their takeoff point, which was forecasting VFR conditions. Sixty miles out, the P-3 declared an emergency and requested a PAR approach to the northwest runway. The request was made in consideration of the crosswind's direction and the secured engine.

Permission was granted for a visual approach and the crew began a descent to 1,500 through IMC conditions. A PAR was again requested, but permission was again denied since the radar for a PAR was aligned for the opposite runway, and at least 15 minutes were required for realignment. The crew then changed their request to an ASR approach to the northwest runway. The approach plates were reviewed and the landing checklist completed. The aircraft was given vectors to final and the controller restated that the minimum descent altitude (MDA) was 740 feet MSL. Just prior to MDA, the co-pilot called "field in sight." Soon afterwards the pilot began picking up his own cues, the view gradually clearing enough to show the P-3 well right of course, just above a large hill and drifting further right.

The pilot immediately added corrective power, climbed and turned 35 degrees to the left. An uneventful three-engine landing followed.

The commanding officer commented:

"The necessity for complete communications during the approach and landing phase is paramount, especially in IMC conditions. (The pilots') familiarity with . . . the terrain at the field obviously assisted them in making the transition from IMC to visual conditions. To have had less experience . . . could have led to serious consequences. . ."

Roving Hornet. The pilot manned his F/A-18 for an air intercept control mission. The aircraft was spotted in the landing area to facilitate a wing spread and wing tip ordnance loading prior to man-up. After starting the engines, the pilot got a signal from the flight deck director that the chains would be broken down for a push back to clear the landing area. The pilot responded with a thumbs up and went back to entering navigational data in the aircraft computer. With his head down in the cockpit, concentrating on the computer, the pilot did not feel the chains being removed. He **assumed** that the blue shirts would take care of the operation. He did not realize that the parking brake was not fully set.

The leader of the ordnance crew was the first to notice that the Hornet was moving backwards. The flight deck director had removed the chains himself, and thus was not controlling the aircraft. The AO quickly positioned himself at the nose of the aircraft and began to wave his red wand in the emergency stop signal.

The pilot caught the movement of the wand and, lifting his head, realized the plane was moving. He stopped the aircraft inches away from the deck edge combing.

AO3 Arthur A. Stevens of VFA 131 gets a well-deserved kudo for his alertness and quick thinking on the flight deck. Brickbats to the pilot and director for not thinking on the flight deck. — Ed.

LSOs Save a T-2. After holding overhead for 20 minutes, the student naval aviator (SNA) brought his T-2 into the landing pattern for his first CQ. He made one touch and go, with no problems. Given the go-ahead, he then made an arrested landing, advancing the throttles to military power at touchdown. The LSOs on the platform heard the unmistakable sound of compressor stalls from the port engine and alerted the Air Boss. The aircraft was subsequently shut down.

Post-flight inspection showed foreign object damage to the port engine's compressor section. Ingested FOD on the flight deck is always a possibility. This SNA was fortunate that the LSOs were alert to the sounds of a compressor stall and stopped the T-2. As the squadron message said, "The pilot did not notice anything abnormal until the engines were checked. Due to the high anxiety of initial carrier qualification it is possible that the pilot just didn't see or hear any abnormalities."

. . . The pilot yelled, "Oh, crap!" into the hot mike. This only confirmed that it was time to get out of the aircraft . . .

My First Ejection

By Lt. Rick Morgan

WE broke at the stern, to impress the flight deck crowd, and followed up with an "OK-3 wire" pass. I felt a good, hard initial deceleration, just as I expected. But then it changed to a short, sharp pull . . . then nothing.

The pilot yelled, "Oh, crap!" into the hot mike. This only confirmed that it was time to get out of the aircraft. We were rolling toward the edge of the angle with too much speed to stop and too little to fly!

All four of us went for our lower handles, with at least two and possibly all three ECMOs leaving prior to command initiation. The Prowler command ejection sequence has a 0.4-second delay between each seat, but when each crew member pulls his own handle, his seat's timer starts. ECMO-3 is always the first out, with no time delay, followed by ECMO-2 (right rear, 0.4-second delay), ECMO-1 (right front, 0.8-second delay) and the pilot (1.2-second delay).

We all left in the proper sequence as the aircraft left the angle and started to settle. What followed was a classic example of how fast you can get out of the seat's envelope while working around the carrier.

My seat went up vertically, with a full chute opening. ECMO-2, leaving 0.8 seconds later (0.4-second delay in the seat and a 0.4-second delay due to later initiation or command from the pilot) rode his Martin-Baker at about a 15-degree angle from the vertical, also coming out with a good chute. ECMO-1 left the aircraft about 0.2 seconds after ECMO-2, probably due to his own initiation before ECMO-2.

By this time, however, the aircraft was rapidly going nose down toward the water, and his seat had about a 45-degree trajectory, with chute opening before impact with the water. The pilot was estimated to have left the bird about 0.6 seconds later and could be seen in the PLAT replay as having a tumbling trajectory in a very shallow arc. He apparently hit the water at or just after separating from the seat, never getting a chute. Although he was injured by the impact, the automatic inflation of his LPA by FLU-8 mod probably saved his life.

Once in my parachute, training took over. A quick grab for the LPA beads (a big "thank you" to whoever designed these, because the old toggles wouldn't have been nearly as easy to find or use) and then the Koch fittings as the water came up. Three or so lines had to be cleared, but I had no abnormal problems as I back-paddled from the ship which was passing about 20 yards from me. The ship's OOD had done a masterful job of stopping the ship, having called for "all stop emergency" with no rudder orders. All four of us passed down the port side.

. . . You can bet that a few of you who read these words will someday join the "Martin-Baker Flight Test Team" . . .

Once the stern of the ship had passed, my mask came off (I had been breathing from the seat bottle), and I began to deploy my raft. At this point, the pros from HS 8 came on the scene and initiated rescue, only three minutes after we had left the aircraft. All four of us were back on deck within 20 minutes, three of the crew walking off and the pilot requiring a stretcher due to a back injury.

This mishap was no "act of God." We had hit an improperly set arresting gear engine (to the tune of one-fourth proper weight), which left us with very few options. What is remarkable to me is how quickly we all came to the same conclusion and left the aircraft.

PLAT analysis showed that 3.7 seconds elapsed from the time the bird hit the deck until I came out of the aircraft. Figuring EA-6B ejection seat delay, we all had to have pulled our handles within 0.4 seconds of this point. What's also worth mentioning here is that all three of the NFOs were convinced they had left the Prowler before leaving the angle, yet the PLAT tape shows my seat firing almost a second after we were airborne again. The aircraft was evaluated as doing about 85 KIAS at this point.

There is one obvious factor in our speed in leaving the stricken aircraft, and it should come as no surprise to anyone. During launches and recoveries, crews should be mentally and physically prepared for ejection at all times. Maybe it's the fact that the rear seats of the Prowler offer so little forward visibility that this has made me get into the habit of "assuming the position" during the critical phases around the boat. I can't say I really understand why crews in other aircraft place their hands up on the glare shield or anywhere but near their ejection handles (unless they are on the stick and throttles, obviously). As our accident proves, the time it takes to move your hands down is *time you do not have.*

For NFOs, don't count on the driver getting you out in time. We all know that he doesn't want to ride one in any more than you do, but each of us has to set his own criteria with regard to ejection.

In this case, there was no doubt in my mind when the time came to go. The combination of sensory and aural cues and a little experience was more than enough. Just as they say you'll know a bad cat shot when you feel one, believe me, you'll know a bad landing when you feel one!

You can bet that a few of you who read these words will someday join the "Martin-Baker Flight Test Team" (or Douglas, or Stencel or whatever). Obviously, I hope I never have to make the decision to go again, but the chance remains.

Stand by, for it could be you on your next flight!

Lt. Morgan is with VAQ 139, an EA-6B squadron based at NAS Whidbey Island, Wash.

Do You Smell Something Burning?

By Bud Baer

IT was a fine Navy day for simulating single-engine emergency landing procedures. The pilot-in-command (PIC) went through the standard NATOPS brief and was assigned an SH-3H on a hot crew switch. He accepted the Sea King with rotors disengaged and No. 1 engine in accessory drive. As PIC, he took the left seat while an instructor under training (IUT), due for a check flight, settled into the right seat. The PIC started No. 2 engine, engaged the rotors and took off to enter the touch-and-go pattern.

After a half-hour practice, the PIC told the IUT to simulate a single-engine emergency. Power was retarded on No. 1 engine and IUT attempted to fly a single-engine pattern to a no-hover landing. He flew the pattern twice, first to a wave-off on final and then to a landing, after which he rolled off the pad because he had came in too fast.

The PIC then took the controls to demonstrate how to do it right. While in the pattern, he retarded No. 2 engine, bringing No. 1 to full power. He began his approach to the pattern when the first crewman said over the ICS, "Do you smell something burning?"

Before he had finished the sentence, both pilots' adrenaline moved into high gear as the No. 1 engine fire warning light and "T" handle illuminated. Now they too, could smell smoke, as an acrid odor began to fill the cockpit.

"Apparently we have something going on in No. 1," the PIC said in a tone which he hoped would sound calm and collected.

Automatically, he put full power to No. 2 engine and reduced power on No. 1. He strained to see what was burning by looking at No. 1 in the side mirror, but he didn't see any fire.

The approach seemed like a much slower process than usual. The seconds were barely ticking by. With the No. 1 needle on both NF gauges at zero, smoke and flames appeared overhead in the cabin area. The first crewmen unstrapped and came forward, the portable fire extinguisher in hand.

The PIC declared an emergency and told the tower he wanted to land on the duty runway adjacent to the pads. This would give the flaming helo more room and permit the crash trucks to roll in quicker.

"Secure No. 1, pull the 'T' handle and fire the main fire bottle," ordered the PIC. "Check the fire extinguisher circuit breaker and fire the reserve fire bottle."

Fire and smoke continued unabated as the helo finally touched down on the runway. The PIC ordered the three crewmen seated aft to abandon the aircraft immediately. They left via the cargo door on the starboard side.

The pilots secured the No. 2 engine, applied the rotor brake, then secured the remaining firewall valve and battery switch.

The crash crew arrived on the scene and began fighting the fire by applying AFFF on and around the No. 1 engine.

The PIC told the firefighters to insert a hose nozzle in the access port on the bottom of the engine access door.

He then suggested that a fire bottle be used to fight the fire inside the fuselage. The first crewman was ready to respond with a fire bottle from the crash truck. He jumped into the smoking helo to fight the fire inside while the PIC ripped soundproofing panels down to deny fuel to the blaze.

The PIC then went up the starboard side and with the use of an insulated glove was able to open the No. 1 engine door to insure that the fire had gone out. It hadn't. It reflashed twice before finally being extinguished.

"Although the crash crew appeared to be somewhat unfamiliar with exactly how to go about fighting a fire inside an engine nacelle, their quick response was instrumental in insuring minimal additional damage to the airframe," the PIC said. "They were on the scene and in action about as quickly as it could possibly be done."

The fire and heat damage was most evident in the No. 1 engine compartment, extending to the engine access panel/service platform and fuselage, both inside and outside the area adjacent to No. 1.

They later found out that the fire had been caused by a sequence of events which began with a cracked fuel manifold tube inside the engine casing. This produced a torching effect, which burned through the combustion liner outer shell. At high power settings, the flame and heat exiting through the drain valve deteriorated the overboard drain hose until it separated from the attachment fitting to the drain valve.

The escape of hot gases into the engine bay melted the Teflon liners of fuel-pressure hoses nearby, causing them to leak. The leaking fuel was then ignited by heat and flame from the broken fuel drain line. Once ignited, the fire's intensity increased steadily with fuel and flames spreading to the inside of the fuselage above the sonar station.

Firing both the main and reserve engine compartment fire bottles did little or nothing to combat the fire. Using the hand-held CO_2 bottle on the overhead fuselage fire was just as futile.

"We had the misfortune of catching fire but the good fortune of being able to land quickly with help arriving almost immediately," the PIC asserted. "Other helo crews experiencing similar fires might not have been so fortunate.

"Yes, it was a fine Navy day for simulating single-engine emergency landing procedures and also a *real* single-engine emergency landing, as things turned out. It emphasized again that things *can* go wrong as a result of circumstances over which we have no control. But how we react to such emergencies is another matter.

"We had extensive time practicing single-engine landings and were fortunate in being able to accomplish this one almost automatically. This proved to us that how well we face up to such contingencies depends on how seriously we have accomplished our homework; that is, sufficient practice for such emergencies and complete knowledge of our aircraft. This time training really paid off and we're here to fly again on another fine Navy day." ◄

Bud Baer is a staff writer for Approach.

The Vulnerability Factor

By Lt. Steven Judd

THE patrol plane commander (PPC) is already wondering what the on-station weather will be like. During the drive from home to the airfield, he's worrying about fuel calculations and maybe adding a few thousand pounds of gas for engine anti-ice and wing de-ice. In the space of a few minutes, he's exchanging his somewhat ambivalent role at home for the leading part in the cockpit of a P-3C Orion.

As the PPC, he'll have to solve problems. He'll make plans, give orders, correct errors, watch instruments, look outside, take precautions, check and double-check. Not only will he be expected to make decisions quickly, but he'll have to keep his mind flexible so that he can change those decisions that may become wrong minutes or even seconds after he makes them. As he drives to work, the psychological factors inside him reveal an intelligent human being, conscious of his enormous responsibilities, now rather tense, highly skilled, courageous, conscientious and very vulnerable.

As a PPC, I have felt that feeling of vulnerability come over me before. Maybe I'm overly sensitive about my limitations. I learned slowly; I was not, by any stretch of the imagination, a "natural." My partners in the training command and the RAG always got higher scores on exams and got more "AAs" for their air work. But I kept at it, studied hard, and now I'm the NATOPS officer in my squadron — an achievement of which I'm intensely proud.

Awareness of my limitations, I am sure, has been an important factor in my success as a first-tour PPC. I don't have the skill yet to try to stretch my craftsmanship beyond its capabilities.

I'm sure there are clever pilots in every community who never feel vulnerable. They acquire a confidence that may mislead them and tempt them to cross the safety margin. Their thinking becomes narrow. They fail to consider the possible consequences of a breach of flight discipline or an over-extension of their abilities.

They assume that conditions at all times will be normal. They assume that the ground is flat without obstructions, that the old altimeter setting is good enough, that there is no other plane in the air, that the weather will hold, that the obsolete chart is reasonably accurate. These are all foolhardy assumptions resulting from complacency, wishful thinking or simply taking things for granted.

There are plenty of things that we are forced to take for granted. We must accept the evidence of our eyes and nose that the liquid in the fuel sample jar is JP-5, that the length of the runway is 8,000 feet if the Enroute Supplement says it is, and that the prop will pitch lock if we have an overspeed in excess of 103.5 percent RPM. We lean heavily on properly trained experts in Maintenance Control and in the shops for vital information, and if they fail us, we cannot help it.

But there are factors which we can check personally — factors that should never be taken for granted, factors that can reduce our vulnerability to a mishap. I have a certain vice that has helped me during my first tour in the fleet. I am an "experience thief"; I steal the experience of others. I read and hear about mishaps and ask myself "Do I fly in such a way that it could've happened to me?" If the answer is yes, I do my best to correct my habits. Little by little, I build up a number of "safety units" that I store in my memory. These units are my treasure, money in the bank, the buffers against chance, fate, bad weather and my own fallibility.

Yet, despite all the efforts to build up my "units of safety," I must admit I still get that vulnerable feeling at times. I love the taste of hamburger with catsup and onions and I love to go on long walks with my girl. My imagination is vivid, and when I fail to see a reported plane in the traffic pattern I become anxious.

I scan right and left. I drop first the right wing, then the left.

Tower: "Lima Kilo Zero-Five, are you having difficulty?"

"Tower, this is Lima Kilo Zero-Five. I do not have the traffic in sight. Say his position?"

Tower: "He is over the end of the runway on final. You are number one to land."

"And how did it go today?" My girl says as she pops the top off a cold beer.

"Very nice," I answer. "Do you think it's too chilly to grill some hamburgers tonight?"

Lt. Judd is the NATOPS officer for VP 26, NAS Brunswick, Maine.

Centered Is Not Always Centered

By Lt. John McCormack

IT was another night air intercept control mission on GONZO station. We were flying regularly, and I had flown an OK 3 wire just two nights before. I was looking forward to this hop, and the brief went without a hitch. We preflighted, taxied and launched right on schedule. It was a black cat shot, but that was all right. A full moon would be up in time for the recovery in two hours.

My wingman (aircraft 200) and I ran four intercepts against a Prowler/Hornet section and headed back overhead for some practice tanking. The moon was rising by now; this was going to be a piece of cake. After completing six quick plugs, we headed to marshal. We were assigned 24 miles, 9,000 feet and a push time in 11 minutes while my wingman was assigned 23 miles, 8,000 feet and a push time one minute before mine. Two laps later, we commenced.

The ICLS azimuth was almost centered. This was great! On azimuth, a full moon and 28 knots right down the angle. This was going to be my night. We went dirty at 10 DME and requested a Mode I. Passing through six miles, we slowed to on-speed, engaged the auto throttles and autopilot. Everything was working 4.0. except for an intermittant ACLS lock on.

CATCC informed us that we had a bad beacon augmentor and that we were unable Mode I. No problem. Disengage AFCS and set up for another auto, OK 3 wire. Meanwhile, we had climbed a bit to 1,400 feet.

CATCC: "3½ miles, ACLS lock on. Report needles."

UHF: "On centerline, approaching glide slope from slightly below."

CATCC: "Roger, concur. Continue Mode II."

Just my luck, I thought. This time the ACLS lock stayed on the aircraft. We tipped over and I took a peek at the ship to check lineup. There was my wingman, right between me and the ship. Lookin' good! Quick check of the VSI. One thousand feet per minute. That seemed a little excessive for the wind they were calling. No, wait. Two nights ago they briefed a 180-degree out wind shear at 1,000 feet, I recalled. Must be the same tonight. It would settle out once I get a little lower. After all, ACLS showed me just slightly above glide slope.

PILOT: "We've got a pretty good rate of descent here, 1,000 feet per minute. Must be that wind shear again."

RIO: "You're starting to go a little low."

PILOT: "Needles show me just a little high."

Pause.

RIO: "You're low. Two and three-quarters miles, 900 feet."

Damn, **that was low!** I figured it must have been the TACAN DME. ACLS was never wrong.

PILOT: "OK, needles show me a little low."

We slowed to 700 feet per minute.

Pause.

RIO: "You're low. Two and one-half miles, 750 feet."

We leveled off to check it out.

PILOT: "CATCC, 201. I show myself at 2½ miles. Do you concur?"

CATCC: "Affirm 201. Well below glide slope."

A varsity play **from 600 feet** put us on glide slope at 2 nm. Then I put the speed brakes out again, re-engaged the DLC and auto throttles, and managed an OK 2 wire.

The debrief with CATCC revealed the following: The final controller was new and under instruction. He had mistakenly locked up aircraft 200 (two miles ahead of me) and was sending that information to my aircraft. Therefore, the needles I was receiving were totally invalid. This, coupled with my wingman's deviations, placed me in a dangerously low situation. The potential for disaster was extremely high.

I learned the following lessons:

- Cross reference ACLS needles with ICLS needles.
- Back up all approaches with self-contained information.
- When in doubt, climb.
- And remember, **centered is not always centered.**

Lt. McCormack is assigned to Fighter Squadron 21, based at NAS Miramar, Calif. He is an F-4 to F-14 transition pilot and squadron LSO. He has received orders to the F-14 FRS, VF 124, at NAS Miramar, as a RAG LSO.

Ultralights: Thrill or Threat

By LCdr. David L. Caswell

Aircraft: Navy Tower; this is Navy Charlie Three Six, left downwind for Two Four.
Tower: Charlie Three Six, report left base, runway two four with the gear.
Pilot: Horsepower 800, gear down, landing checklist.
Co-pilot: Traffic, 12 o'clock! Hard right, hard right!
Pilot: Max power . . .
Co-pilot: You're over 30 . . . over 45.
Pilot: Max power, max power . . . are we clear?
FE: Did we hit him?
Pilot: I don't know. It was real close . . . I didn't feel anything. Can you see it off to the right?
Co-pilot: Nothing airborne. Yes, I do. It's . . . it's an ultralight. He's just motoring toward the river.
Pilot: Can you get his number?
Co-pilot: I don't see one. It's just a red and blue ultralight.
Pilot: Tower, this is Charlie Three Six, we'd like to re-enter a left base for runway two four. We had to deviate for an ultralight at about our one-thirty position.
Tower: Charlie Three Six, we are not aware of any traffic in the area. Did you get his number?
Pilot: Negative.

So ends an increasingly common story of one of the most recent hazards to military aviation, the ultralight aircraft. By themselves, these frail aircraft do not represent any unique danger, but when mixed with transports or high performance aircraft, serious safety problems arise. The first reported deaths due to an ultralight colliding with a conventional aircraft occurred in the summer of 1985. A corporate jet on final hit an ultralight, killing the jet's co-pilot and the ultralight's pilot. Five others were seriously injured. According to the airport operator, the ultralight did not have radio contact with the airport.

There are several factors that go into making the ultralight a special kind of problem for the ATC system. The first are the manufacturing guidelines contained in the Federal Air Regulations (FARs). Some guidance is given, but little is mentioned regarding equipping the ultralight for operation within the ATC system. Ultralights frequently operate without a radio, altimeter or even an airspeed indicator. The dealers advertise that no special training or skill is required to fly an ultralight, and emphasize that the aircraft is simply built.

This leads to the second and perhaps most important factor, the skill level of the pilot. A large number of pilots flying ultralights have no license, **and one is not required.** They often have little training in airspace restrictions, navigation or communications, and they don't realize the threat they may present to conventional aircraft.

The last and most insidious factor is that ultralights are small, hard to see, and don't show up on radar. These phantoms, operating outside the ATC system, show up unannounced, sometimes too late to avoid.

There are a few things that can be done to begin solving the problem. The first is to see and avoid. Air stations should publish NOTAMS for ultralight fields in the vicinity. This information will alert pilots to use extreme caution when operating in and out of an airport with ultralights nearby. Secondly, squadrons should maintain an aggressive reporting program. Even though the ultralight pilot may be unlicensed and difficult to contact, report each encounter and include a detailed description of the ultralight. Working with local ultralight groups and establishing liaison with local dealers and airfields requires effort, but a little education can go a long way in solving the problem.

When ultralights are flown away from airports that serve conventional high-speed aircraft they pose no threat to others and provide the thrill of flight to many who otherwise would not fly. When ultralights become a safety hazard, as they can, the problem must be addressed directly through vigilant, aggressive reporting and education. ◄

The FAA is developing air traffic control procedures for ultralight vehicles. Navy/Marine Corp air stations that have an ultralight field close by may want to submit this information to Naval Flight Information Group (NAVFIG), Washington, D.C., for entry into the appropriate FLIPs.

For more on ultralights and their impact on military aviation, see "Those Dangerous Flying Chairs" in the March 1985 issue of Approach. — Ed.

LCdr. Caswell is the operations officer for VP 67, a Naval Air Reserve squadron at NAS Memphis, Tenn.

A Day in the Life of a Varmint

By Capt. Michael Blaine, USMC

Prevention, in this pilot's opinion, is the best way to keep that zero mishap record intact. If reading about a mishap prevents another one from happening, then reading about a "near mishap" goes one step beyond in prevention effectiveness. Even if one hasn't been and never intends to be a flight instructor, many will still probably nod his/her head in silent agreement as that voice inside reminds us, "I've been there." For those who worked with or flew with and feared him, the original author needs no introduction — he was known only as THE VARMINT.

IT'S a rainy, cold Friday morning. I'm five minutes late for my brief but my student is sick, so I'll be a target. My wingman is not here yet, so I'm briefing his student. The flight duty officer (FDO) is not here yet, so I'm answering the phone and I'm screaming at the students for phoning the FDO to ask about the weather. In spite of the fact that I'm tired, cold, wet, angry, have no student to fly, acting as the FDO and waiting for my playmate to show, I am calm. I know that after this hop, I'll start my "get away" weekend with my wife. No kids. No students. No schedules. No zero-dark-early briefs. Just she and I. Pleasant thoughts wander through my brain housing group.

Exactly one hour after my arrival, my playmate shows up! "Hey, Varmint, I didn't think the hop was going. The WX looks rotten."

"When did you get your meteorological degree, Showboat, and since when are we paying you to think? WX ways it's gonna get better. Grab your trash and let's go!"

Running through a rain squall on my way to aircraft issue, I think of my wife. Get-away weekend, here I come.

"Hey, Ron! What is this, a fleet aircraft? This thing's got a ton of discrepancies. A couple are repeat compressor stalls." Not to worry, the bleed air valve fix has solved all those problems, hasn't it? Enough negative thinking.

Sure is cold out. Wish I had someone to help with this preflight — damn! I forgot my PRC-90. I'll go back and get it. I can see Showboat on the other end of the flight line getting in his plane. He'll wait. I've got the lead.

In and out for the radio couldn't have been three minutes, but I can see Showboat turning already. Got to hurry with the preflight. Better pull my approach plate out of my bag. Weather doesn't look that great. What's this red stuff, blood? How'd I cut my finger? I don't recall. These parachutes are tough to get on over a flight jacket. I won't have to worry about them when I get back to helos.

The pre-start, start and pre-taxi checks sure go fast when you don't have a student to slow you up. Showboat's been turning and burning for a while. Why's he making the taxi call? I won't argue on ground. Just go with the flow; only a couple more hours.

Run-up, pre-takeoff and check-in went quick, but tower is confused about who has the lead. I think they've got it now. I'll take a VFR departure. Weather's gonna get better and it will save time.

Now Departure is confused about who has the lead. Wish Showboat would have kept his mouth shut for another minute or so. At least weather was right. It is VFR, sort of, between layers. Nice flying without a student. Nothing to worry about. Showboat and I have been flying together for two years. We know what to expect. It does get a little boring. Everything's canned. But nothing much ever goes wrong.

This weather is like flying in a milk bottle, I can hardly see him.

"Hey, Showboat, it looks like its closing up. Let's go find Brewton and get your low work."

"I thought I saw it back there in a hole. Brewton, landing?"

"Brewton landing 30. Runway change in progress. We will be open for business in 10 minutes."

No problem. We can do the lead change and come back. Showboat can take us back after that. Easier to shoot an approach with two people in the plane. God, this weather is getting ridiculous, like flying in a milk bottle.

"Showboat, let's go home. This is stupid. What do you mean he needs more work as wing? He can hardly see me now. OK, I've got the lead."

Now where's the approach plate? Wish I pulled it out when I was thinking about it. How'd I get in a 30-degree angle of bank descending turn?

"Sorry, Showboat."

Boy, he sure can fly tight in the goo. Wish he had the lead. This single pilot stuff rots. Switch button 5 for approach.

"Pensacola Approach, Echo 947 and flight 15 miles northeast of Whiting for random pickup, negative information."

"Roger 947, squawk 0403, fly heading 190 for a TACAN 14, landing runway 14."

Turning, changing transponder and clipping my approach plate onto my leg all at once. God, I'm good. Damn! Off altitude again. Showboat is still hanging in there. Fourteen's a straight-in approach, heading 124. Easiest approach at Whiting. MDA is 500: No sweat. I've always broken out before MDA.

All trimmed up and on the bearing. Drop the gear, switch channel 2 and call Allens.

"North Tower, Echo 947 and flight are Allens inbound."

"Roger 947, report 3 DME." Gee, I usually break out by now. "North Tower, 947 is three DME, no field in sight." Where's the field? Holding 500 feet and I can see the trees. They sure look close. Wish I had a student to look out for the runway. There it is! One point five DME. Kind of close. Give Showboat the loosen up signal and shoot the straight-in. Gotta get the landing check. It's really raining hard. Guess I'll get home early for the weekend. Super.

If I had gone much farther, I would have had to divert. What was the alternate? For that matter, what was the missed approach procedures? I never looked. That's pretty stupid! What else did I forget? I didn't get the weather before calling Approach. We had some shaky section coordination. More like uncoordination. I'll do a good post-flight and think about this. How could I have not filled out the yellow sheet? This is scary. I'm an instructor. I'm not supposed to forget things or make mistakes or get complacent. This whole thing could have ended as a smoking hole. Then I would have missed my get-away weekend! ◄

Capt. Blaine served as a T-34C instructor with VT 2 and is currently stationed at Camp Pendleton, Calif.

Believe It or Not It's Thunderstorm Season Again

By Lt. Brian Roby

HOW many "believe it or not" stories have you heard in the ready room when it comes to thunderstorms? "Believe it or not, the turbulence was so bad that all we could do was maintain power and attitude and ride it out. We were bouncing so violently neither of us could focus on the engine instruments long enough to determine if there were secondaries for the fire warning indication on the left engine, not to mention the chip on the right engine."

"Believe it or not when the radar scope was reinstalled, they put it in upside down so the azimuth ring was 180 degrees out. It made it appear as if we were going directly away from the major cell activity when in fact we went right through the heart of it. The hail was about the size of golf balls and the lump on my head was the size of a grapefruit after being slammed into the overhead on that first unsuspected drop. We made it through in one piece, but it was questionable whether the aircraft was considered a survivor or not."

"Believe it or not when I picked up the PAR final controller, the wind was down the runway at five knots with a line of thunderstorms approaching the field. When I received my landing clearance the wind was a quartering tail wind clocking in at 40 knots. The precision approach was hardly what you'd call precise; it was more the case of just trying to

stay in the ball park with idle power to maintain glide slope."

The pilots who related these stories to those of us who didn't know whether to believe them or not, are probably flying a little more cautiously these days in the presence of those towering demons, so they can use just their imagination to make up the next episode in thunderstorm penetration. The lessons are so numerous that you'd think someone could devise an effective means to alleviate the phenomenon. Hazards associated with thunderstorms — lightning strikes, wind shear, hail and turbulence are still causing aircraft mishaps every year.

With the thunderstorm season rapidly approaching, we should develop a defense posture to insure pilots maintain a healthy respect for towering cumulus and convective activity. The best advice is complete and absolute avoidance, which is not a very rational approach considering those maturing cells grow faster than our weather guessers can write, in some instances displaying a vertical growth rate of more than 3,000 feet per minute. Where do you start in developing a plan of attack to hedge against a mishap this thunderstorm season? One idea is to grab that nugget who checked in not long ago and have him do some research on thunderstorms for a quick wardroom brief. Any nugget who reads this will probably think that the term "nugget" is used rather loosely, but because of his level of experience he has not had the first hand lesson of the destructive power inside a thunderstorm. We owe it to him to try to keep him from experiencing his own "believe it or not" story.

Following are just a few suggestions to include in the brief:

- Talk about your weather radar and how to most effectively use it for weather avoidance. In order to successfully use your radar you must have a general knowledge of thunderstorms and a good knowledge of the forecast weather ahead.
- Continuous vigilance on the radio will give you clues as to how much activity lies ahead. When other aircraft start diverting and climbing above your service ceiling for avoidance it may be time to look for a new route before you get into a "box canyon." Also convective segments are given with their coordinates over center frequency, so listen up.
- Tuning in the LF-ADF to a local station will show you proximity and quantity of electrical activity in the area, as the needle will momentarily point in the direction of an electrical disturbance. This is sometimes referred to as the "Poor Man's Radar."
- Briefly review cloud identification, cloud "reading." This is especially important when bobbing and weaving around garden variety thunderstorms, as not all thunderstorms present a classic profile. Some of us have been very surprised by the severity of turbulence encountered in a cumulus "Puffball."
- Always avoid taking off or landing in thunderstorms. If there is a low level wind shear alert system (LLWS) at your field, have a meteorologist give you the particulars.
- Discuss your operating area as related to peak storm months and the level of activity during those months. Below is a chart based on reports from the National Weather Service reprinted from the Department of Transportation.

Here are a few more helpful hints:

- While flight planning, check not only for, and avoid, WWs but also attempt to circumnavigate some of the other TRW ingredients that keep you on the edge of your seat, like military weather advisories, convective segments, and areas of six-tenths towering cumulus coverage or greater.
- No one should ever intentionally attempt to fly through, under or over a thunderstorm. If you intend to fly over one, make sure you can clear it by at least 1,500 to 2,000 feet to avoid hail.
- Do not fly under the anvil, if possible fly to the upwind side and circumnavigate severe activity by at least 20 miles.
- Statistics show that flying at the freezing level will increase your odds of being struck by lightning. This is especially true if your aircraft is being charged in clouds or precipitation. As the aircraft builds up a static charge beware that an increasing amount of static in the headset could mean impending lightning strike.
- Hail reaches its maximum size at the freezing level also. So all around it seems best to avoid flight at or near the freezing level for a prolonged period of time.
- Remember lightning strikes rarely cause significant structural damage. You may experience radio problems or magnetic compass failure but don't loose your head. Aviate, navigate and communicate.

When you get a good thunderstorm avoidance brief, hold on to it and rebrief it seasonally. It may lessen the number of "believe it or not" stories in the ready room or it may start a new one . . . "Believe it or not, I turned around and landed to wait it out." The best way out of any situation is VMC circumnavigation.

Lt. Roby is the Aviation Safety Officer for VT-28 at NAS Corpus Christi, Texas.

. . .My heart skipped a beat as I waited for the aircraft to climb. There was a faint "thump" as we began to climb and turned to our missed approach heading. . .

Sign Strike

By Lt. Tim Sullivan and Ltjg. Steve Ericson

ANOTHER training hop was almost over. The weather had been great; a clear, moonless night. In the back seat of my TA-4J, the student naval aviator was busy flying partial panel instruments under the bag. Just one more precision radar approach and we'd call it a night. After a cross-country a couple days ago, it was nice to be working with Navy controllers again. They were really good here at our home field.

As we started down glidepath, I began recording the student's deviations and corrections on my kneeboard card as I had his three other approaches. He let it sag a little here and there, but corrected well. Inside one and one-half miles, he let it get slightly below again and I made some more notes.

After two or three "slightly below" calls we heard, "at one-half mile, slightly below glidepath, execute your climbout instructions. . . ." I felt the power come on as I finished writing and looked up at the runway. As I watched, we appeared to accelerate into the black hole of the runway! I took the stick and increased our attitude to "on-speed" in an effort to break our rate of descent.

My heart skipped a beat as I waited for the aircraft to climb. There was a faint "thump" as we began to climb and turned to our missed approach heading. Everything seemed fine. I asked approach how low we had flown and was told slightly below. I flew the next approach to a full stop as planned. We suspected a birdstrike but found no damage on our post-flight in the dark.

The next day we discovered a crease down the starboard drop-tank and one tank fin peeled back. We *had* hit something. What really scared me was finding out we had hit a sign pole six feet off the ground about 2,500 feet short of the runway! How did I get there?

After riding in so many practice approaches I had become complacent. At decision height (DH), I had come to accept that we were 200 feet AGL, and therefore had comfortable room to execute a missed approach. Wrong. DH

is 200 feet AGL from "the highest part of the first 3,000 feet of the runway," not from the terrain you are *over* at DH. The terrain 3,000 feet short of our runway is a *hill* gradually sloping down to the runway. "On glidepath" at one-half mile we would have been only 185 feet AGL.

A controller's interpretation of "slightly below glidepath" at one-half mile equated to *85 feet* above ground. That's a lot lower than I realized. The approach complies with the terminal instrument procedures (TERPS) manual requirements for obstruction clearance. TERPS allows that we could be "on glidepath," at DH and be as little as 140 feet AGL, still a safe enough margin. However, in our case the controller's estimation of slightly below was a little off. We were "slightly below" and evidently sagging slowly lower as we continued inside one mile. That trend was not observed by the controller.

My ace SNA was tired, but I didn't think about that and anticipate his error. He rotated too slowly to the missed approach attitude. It was just a *little* too slow, but that ate away at my imagined 200-foot clearance. Tack on our failure to crosscheck our radar altimeters, an "acceptable" error of 45 on the high side in our pressure altimeter and no optical landing system on the runway and you get a crash . . . almost. Only six feet to spare.

Controllers in the tower and approach noticed the low altitude but all a moment too late to pass a wave-off prior to observed climbout. We calmly ended up six feet off the ground half a mile from the runway. If we had not hit the sign, we would never have known how perilously close to death we really were.

Precision radar approaches are designed to provide safe approach obstacle clearance. Decision Height (DH) and glidepath angle are predicated on terrain and other factors, including obstacles, aircraft sink rates and pilot reaction time in the case of DH. All Navy and Marine Corps published instrument approaches are reviewed annually by the local ATC facility and then submitted to Naval Flight Information Group (NAVFIG) in Washington, D.C. for ultimate review and approval.

A precision radar approach is just that; a very precise instrument approach procedure. Controllers are taught, beginning in fundamental school training, to give glidepath and azimuth information as accurately as possible. Additionally, they learn that DH is an altitude as opposed to a point on the glidepath or distance from touchdown.

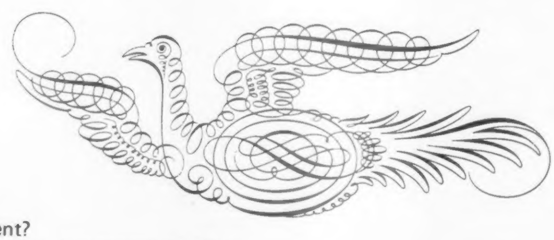
The authors state that the aircrew's "sagging" lower trend was not observed by the final controller. One has to wonder if DH was ever actually called during this series of approaches? It is incumbent upon controllers reading this article to reaffirm established procedures for continuously monitoring aircraft under their control, including those advised to execute climbout instructions — that is, the complete approach.

Incidentally, a DH check is not part of the FAA flight check for a precision radar approach. Maybe it's time to include it in the periodic flight check in order to correlate the controller's DH call with the aircraft's indicated altitude — ACCM Frank McGee, air traffic control analyst, Naval Safety Center, Norfolk, Va.

Lt. Sullivan is safety officer for VT 7 at Meridian NAS, Miss., where he is a flight instructor in TA-4Js. A 1977 Southern California graduate, he previously flew F-4s off the USS *Midway* (CV 41).

Ltjg. Ericson, also a TA-4J instructor, is VT 7's assistant administrative officer. A University of Texas (Arlington) graduate in 1981, he earned his wings in 1984 at VT 4, Pensacola NAS, Fla.

How Cum?



DID you ever see a bird have an accident?

Some birds make pretty weird landings. That's DESIGN ERROR.

Birds get smashed by hail, thunderstorms, etc., but that's WEATHER FACTOR.

A bird with a broken wing can't fly, but that has to be MAINTENANCE FAILURE.

And of course the mother bird may push the youngster out of the nest too soon. Call that SUPERVISORY ERROR.

What I mean is the plain, old garden variety BIRD ERROR accident. Like a bird fails to pay attention to what he's doing and flies right into a tree trunk. Or he gets so engrossed in looking at something that he quits flapping his wings and goes crashing to the ground.

Why is it then that this lowly creature, who can't read, can't reason, and can't benefit from other birds' experience, and who knows only what instinct and his mama taught him, goes through life without having an accident?

And why is it that we thinking, reasoning, superior, intelligent human critters do?

Courtesy U.S. Army *Aviation Digest*

"There's no 'good' place to have your appendix rupture but one of the worst places is in the cockpit."

A Matter of Timing

By LCdr. G.W. Faber

TWO days prior to a port visit to Bermuda, the helicopter det OIC aboard a destroyer had experienced some stomach problems and loss of appetite. Thinking that it was a touch of flu, he decided to "gut it out" since the ship was involved in a training exercise, and he had only one other helicopter aircraft commander (HAC) on the det. As a precaution, he did report to sick bay and talk to the corpsman who prescribed something to relieve the stomach discomfort and some Tylenol for the aviator's slight fever. The aviator verified with the corpsman that the medication would not affect his alertness or flying status, and prior to leaving, agreed to return if the problems persisted.

The stomach problems continued, but were mostly just annoying. Regular and frequent use of the medication kept the discomfort in check. Once in port, he treated himself with a vigorous workout and a good night's sleep. The treatment seemed to work and he made plans for a run ashore. Before leaving the ship, however, the OOD told him of a possible SAR tasking.

Earlier that morning tragedy had struck a sailing vessel participating in a transoceanic race. During a storm, it had overturned and sunk with 20 hands aboard. All available SAR assets were required to assist.

Upon hearing the report from the OOD, the DET OIC mustered his aircrew and maintenance personnel, briefed them and started preparation for the SAR effort. Fortunately, only one member of the detachment was already ashore — the other HAC. Within an hour a clear picture of the situation was available, and the DET OIC and his crew launched in their Sea King while still alongside the pier. The ship put to sea shortly thereafter.

During the next two days the OIC flew 16 hours of SAR ops. The other HAC had been left behind because of the ship's emergency sortie and wasn't able to rejoin the ship until the third day. The OIC's stomach discomfort was getting much worse by this time and the arrival of the other HAC was greatly appreciated.

The OIC flew another three-hour mission on day four and had finally decided that he was going to ground himself. During the last half of this flight, the discomfort was severe and he flew much of the flight with his lap belt loosened. He informed the crew that he was feeling poorly, but would continue to "gut it out" till the scheduled recovery time.

The corpsman wasn't in sick bay when the OIC checked after the flight, so he forced down some soup for lunch and decided to lie down. About a half hour later he woke up with very severe, sharp pains in his abdomen and couldn't even straighten up. A phone call to sick bay got no response so he called the OOD.

A few minutes later the XO and corpsman arrived. The diagnosis was a burst appendix. A few minutes later the aviator was medevaced to an accompanying AOR which had a doctor. The doctor confirmed the diagnosis and recommended that the aviator be medevaced ashore.

Several hours and 150 miles later, the appendix was removed in the Bermuda hospital. For the first few days, things didn't look too good for the young aviator, but thanks to treatment with large doses of antibiotics he recovered and was discharged 13 days later.

The timing was close. What would have happened had this hard-driving aviator not been in his cabin, but in the aircraft when he went hard over with pain? There's no "good" place to have your appendix rupture, but one of the worst places is in the cockpit.

The next time you self-medicate or make plans to "gut it out" when you feel less than 100 percent ready to fly, consider the consequences. Your timing might not be as good. ◄

LCdr. Faber is an H-3 pilot with tours in HS 7, HS 1 as an instructor, and as an exchange pilot with Canadian Armed Forces squadron HS 423. He is currently stationed in Washington, D.C.

Mast Bumping

By Maj. Arthur A. Adkins, USMC

Since the introduction of the term "mast bumping" into
24 Navy and Marine Corps aviation terminology shortly after a fatal UH-1 crash in 1978, the subject has been constantly debated. There have been NATOPS changes to changes, articles in Approach and, of course, much cussing and discussing at the squadron level. Although I don't pretend to have the final word, I do have a few simple observations that should stimulate a little more thought and lead to a better understanding of this phenomenon.

While teaching helicopter aerodynamics at the flight instructor's training course in Pensacola, I had the opportunity to gather information from various sources: the Naval Safety School in Monterey, Calif.; Army Helicopter Training School in Fort Rucker, Ala.; Test Pilot School in Pax River, Md.; and directly through Bell, Sikorsky and Boeing Vertol representatives. Fort Rucker spokesmen told me that the Army had been using mast bumping as an accident classification for quite some time. They also referred to entering into the "low G" realm almost exclusively through improper "bunting," which includes lowering the collective and applying forward cyclic to maintain terrain masking. Recovery technique for this situation is "brisk aft cyclic." **This is observation No. 1.**

Because mast bumping is associated strictly with semiarticulated rotor systems, Bell Helicopters offered the only manufacturer information that directly pertained to this discussion. However, Bell did not discuss the envelope below .5 G. Obviously, as military pilots and all-around sensible people, we are limited by NATOPS and good judgment to flight at or above .5 G. This leaves the realm of zero to .499 G flight unexplored except through actual mishaps, inadvertent flight or theory. Theory is nice but lacks the impact of actual "hands-on" experience. **This is observation No. 2.**

My third observation involves a simple but often misunderstood question. How does one go about changing helicopter fuselage attitudes in flight? We have no ailerons directly attached to the fuselage. It is not just a matter of changing pitch on our "wings" (rotors). We can change the angle of the rotor disc, but the head can act independently (free gimbal system), as it does when the helicopter is sitting on the deck during a control check. The helicopter is somewhat of a "plumb bob" underneath the rotor system. By changing the thrust vector thereby imparting acceleration of one sort or another, the center of gravity of the helicopter attempts to align itself underneath the vector.

In normal flight the rotor system is pulling the helicopter around. This is called "controllability," i.e., how well the helicopter responds to cyclic and collective inputs. But as pointed out by R.W. Prouty (chief stability and control analyst, Hughes Helicopter, Inc.) in "Rotor & Wing" of November 1981, "Since teetering rotor systems obtain pitch and roll control by tilting the rotor vector, control power depends entirely on maintaining load on the rotor." He goes on to say that the less the load, the more movement of the rotor disc required for the same fuselage movement. At no load on the rotor (zero G), the blades will respond to cyclic and collective inputs (as in the ground control check), but the helicopter is no longer being "pulled" around by the blades.

The danger here is that without the helicopter fuselage and mast responding to the rotor movement, the precious 17-degree or so base line separation between blade stop and mast can be exceeded very easily by cyclic inputs and normal flapping. In the fore-and-aft axis, the blades will probably hit the tail boom before the static stops sever the mast. Therefore, "brisk aft cyclic" (or brisk **any** cyclic for that matter) can be fatal in the low or zero G flight regime.

What we need to do as pilots is, first and foremost, stay out of this flight regime if at all possible. Once in zero G, realize that it is transient, usually a very temporary condition. As the helicopter settles and you again feel pressure in the seat of your pants, the blades are again pulling the helicopter about. In the brief regime of zero or low G, center the controls and increase thrust (if necessary) the way helo pilots always increase thrust with up collective.

The last observation is about how the H-1 NATOPS man-

uals came to read the way they do. Why is something that appears to be so simple so widely misunderstood?

Back to observations No. 2 and No. 1 in that order. There were no definite test results to consult. The Army had already made a training film on the subject and had clearly defined procedures. Why not assimilate their information? That was the quickest and apparently the best-founded policy at the time. "Brisk aft cyclic," the training film says. But if the film is closely watched, the pilot in the film appears to enter the low G condition through improper "bunting" (observation No. 1) which included brisk *forward* cyclic. As a correction, again demonstrated in the film, the pilot seems to apply "brisk aft cyclic" to the *neutral position,* never to aft of center. This works fine if you get into the situation that same way. You can, however, arrive at low or zero G by lowering the collective too fast or by improperly completing any number of maneuvers that do not include forward cyclic.

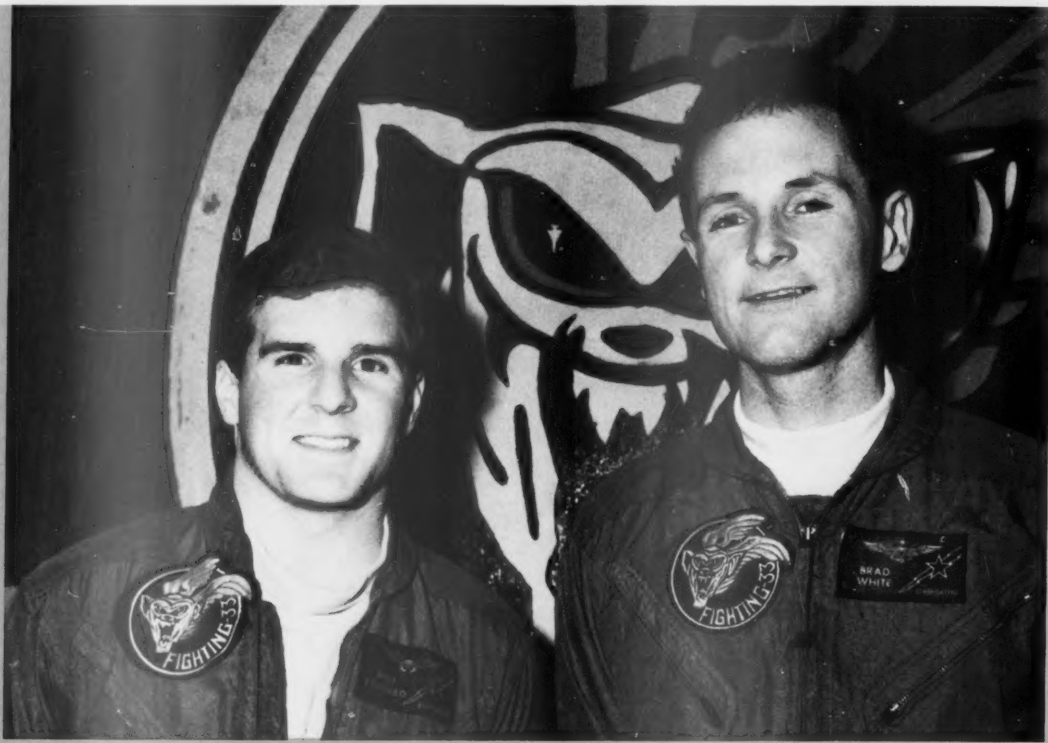
As in any feature of aviation, relying on acronyms, buzz words and key phrases to trigger recall of sometimes complex information is certainly acceptable. However, there is nothing that can take the place of understanding. There are no shortcuts, even in helicopter aerodynamics. Too many of us have accepted the "magic, mirrors and strings" bar room approach to helicopter aerodynamics for too long. It is just not that hard to think through. Mast bumping is no exception. Observation No. 3 applies.

In summary, controllability in semiarticulated rotor system helicopters depends entirely on maintaining a load on the rotor system. Approaching zero G (no load), we lose more and more control, to the point where no amount of cyclic movement, in any direction, will produce any corresponding fuselage movement. Obviously, we pilots want to stay out of this flight regime. If we do inadvertently get into low or zero G, we only have two choices. Up collective will directly increase thrust and therefore increase "load," reducing the severity of the situation as the cyclic becomes more and more effective. However, special attention must be given to engine and rotor limitations. Because zero "G" can fairly accurately be likened to "floating," it is by nature going to be extremely temporary. Center the controls, wait for the helicopter to start to settle, thereby regaining normal G on its own. The key phrase here is "center the controls and wait." Probably easier said than done, but by understanding the entire phenomenon we can teach ourselves to react correctly.

Again, to prevent mast bumping during low or zero G conditions:

- Center the controls and wait for normal G to return.
- Or, if immediate action of any kind must be initiated, increase collective to increase load on the rotor system, thereby accelerating the return to normal G flight. ◄

Maj. Adkins is conducting research on mast bumping while attending the Marine Corps Command and Staff College, Quantico, Va. An Ohio State University graduate, he was a helicopter aerodynamics instructor at the Naval Aviation Schools Command. He has some 1,400 hours in semiarticulated (teetering) rotor system helicopters.



Ltjg. Matt Columbo (left),
Lt. Brad White (right).

The Air Medal

Lt. Brad White
Ltjg. Matt Colombo
VF-33

After completion of a 1V1 ACM engagement, Starfighter 214 was informed by the adversary pilot that fuel was streaming from the nozzle area of the starboard engine. Recognizing the high potential for an in-flight fire, the Tomcat crew shut down the right engine and opted for an immediate return to base. Within minutes the only remaining hydraulic system abruptly failed, forcing automatic reversion to the backup flight control module, a severely degraded flight control system. Lt. White and Ltjg. Colombo performed slow flight checks of their crippled Tomcat and concluded that 195 KIAS was minimum control air speed. However, on their first approach the F-14 experienced severe pitch oscillations at 200 KIAS. White immediately executed a single-engine wave-off and nursed the Tomcat around a densely populated area to set-up for another approach. Again the F-14 suffered pitch oscillations but White kept the stricken aircraft on the runway and the Tomcat grabbed the long field gear, finally coming to rest.

The squadron commanding officer commented, "Only superior airmanship, the assistance of thoroughly professional LSOs, approach control, tower personnel and crash crew prevented a potential disaster. Lts. White and Colombo were subsequently awarded the Air Medal by Commander, Tactical Wings Atlantic.

BRAVO ZULU

Maj. Eddie A. Daniels
VFA 106

Maj. Daniels departed NAS Cecil Field on an F/A-18 functional check flight for an engine change. At FL 350 and 250 KCAS the aircraft suddenly became uncontrollable, oscillating wildly in pitch. He regained minimal control of the aircraft by reducing airspeed and locking his elbows under the canopy railing to hold the stick as steady as possible. The aircraft flight control display indicated that the horizontal stabilator had failed in channels 1 and 2, and would not reset. Through his mirror he observed the right stabilator moving cyclically full up and down at a rate of one complete cycle every two to three seconds. The flight control computer, sensing this pitching action as an external force, was commanding the other flight controls to respond, thereby creating a rolling motion. In an extremis situation not covered in NATOPS, Maj. Daniels was able to maintain sufficient control to set up for a 160 KCAS, full-flap approach. At airspeeds less than 160 KCAS the right stabilator stalled and the aircraft rolled right. At higher airspeeds the increased authority of the stabilator degraded the handling qualities to an extent that attempting to land was not practical. On short final at approximately 30 feet AGL the stabilator went hard over nose down. The aircraft touched down flat, bounced once, then engaged the arresting gear. Inspection revealed no structural damage to the aircraft. Maj. Daniels was awarded the Air Medal.

The Air Medal

Whoa, Nellie!

By Cdr. Pat Mulvany

I GUESS the first time I really thought about all the factors that can influence a landing was following a professional *faux pas* many years ago. I was on a routine out-and-in between two deep south air stations in my trusty two-holer TA-7C. The object was to drop off a fellow aviator for official business and bag a little flight time. It didn't hurt that my folks just happened to live near the destination and promised to be there to say hello during my turnaround.

It was a clear day and I was anticipating good conditions at the break. Sure enough, I was cleared as requested. I wanted this one to be a beauty. . . Into the break at 300 knots, nice snappy roll rate, good hard pull, speed brake to gear speed, good gear, good flaps. How'd you like *that* display of avian expertise, Pop?

I called abeam with gear for a full stop, and got my clearance to land. Then I double-checked the gas — a little heavy, but within limits. I barely heard the wind call from tower. Centered ball, nice pass, touchdown.

Passing the five board, the scenery seemed to be going by *real* fast, in spite of my best aero-braking technique. The four board rushed up at me and I was still faster than I wanted to be. The anti-skid was working, so I programmed in a whole bunch more decel than I was used to. Whoa, girl! Slow down! Whew! I made taxi speed with several yards to spare and managed a safe, slow turnoff.

As I taxied back toward Base Ops, I attempted to analyze the squirrelly nature of the rollout. The cool breeze in my face and the windsock pointing behind me provided the first glimmers of understanding. Good grief! I had landed with a *tailwind*, and I was heavy to boot. The embarrassing aftermath of this blunder included quieting my passenger, explaining to my Dad the purpose of the big fans now blowing on my main gear, the logical function of the fusible plugs, and why smoking wheels were perfectly normal after a tough landing on a little 9,000-foot strip. Dad nodded understandingly. Mom wasn't buying it.

I was lucky. In spite of several mistakes, including inattention (missed the wind call), bad judgment (jumped harder on the binders rather than taking it around), and non-professionalism (allowing the presence of important spectators to influence my actions), my airplane and I survived. The fusible plugs didn't blow, and I was able to RTB in less than an hour, somewhat humbled, but maybe a little wiser.

Since that incident, I have made every landing an exercise in analyzing all known factors — the runway environment, the aircraft systems and rollout dynamics. Here are some of those factors:

I. Runway environment

A. Wind

1. Direction and Strength

a. How will it affect my pattern — adjust the abeam?

b. Undershooting? Or worse, overshooting? Shear?

c. Is the duty runway appropriate? Should the guys in the tower have changed it for shifting winds?

2. Head wind/Crosswind Components

a. How much crosswind? Is it in limits?

b. The greater the crosswind component, the less the head wind component to aid decel and decrease landing rollout.

c. Need to think about crosswind landing technique.

3. Low Wind/No Wind

a. Light and varible? Oh-oh. No head wind component.

b. What's my gross weight? Is there a longer runway?

B. Precipitation

1. Rain

a. Is the runway wet? Standing water? Reported braking action? How long is the runway? The longer, the better.

b. Do I need to trap? By doctrine or by common sense analysis of the risk?

2. Ice or Snow

a. Better not be a surprise — must have thought about it and reviewed appropriate landing technique.

b. *Low* coefficient of friction. Slippery. *Slow* decel. Need a long runway or a trap.

c. Be ready to take it around. Is a trap smartest?

C. Field elevation

1. The higher the field elevation, the faster the TAS at touchdown, and the greater the energy to dissipate. Need more runway.

2. Is it hot outside? Max aero braking. Easy on the binders. Hot brakes highly probable.

D. Arresting gear — Where are they? Be ready to throw the hook down, if necessary.

II. The Aircraft

A. Gross weight — Where is my gas? Am I under max gross for landing? Am I relatively heavy? That means faster approach speed, slower decel — need lots of runway or higher head wind.

B. Systems

1. Angle of Attack (AOA): Good AOA vs. Airspeed. Check downwind. In the ballpark? Gauge and indexers reliable? Can I believe them?

2. Anti-skid: Any indication of failure? Must be primed to turn it off if it doesn't work.

C. Symmetry — Are any conditions imposed by asymmetry? Do I need to put a crosswind under a heavy wing? 29

III. The rollout

A. Touchdown — Was it good? Did I add power in close to stop a settling ball or a decel?

B. Initial decel — Best aero braking. Watch the crosswinds. Is it gusting? Don't let AOA spike. Don't skag it.

C. Braking — First application is critical. Don't jump the gun. How are the speed/distance-remaining checks? Do I need to take this one around? Good braking with anti-skid? Firm, linear decel. If no brakes, take it around. A trap will cure almost all brake problems.

D. No nose gear steering — Ready to use it for directional control problems. Ready for hardover. Engage it when slow for a safe, controlled turnoff.

E. Long field gear — Where is it? Am I ready to use it if necessary?

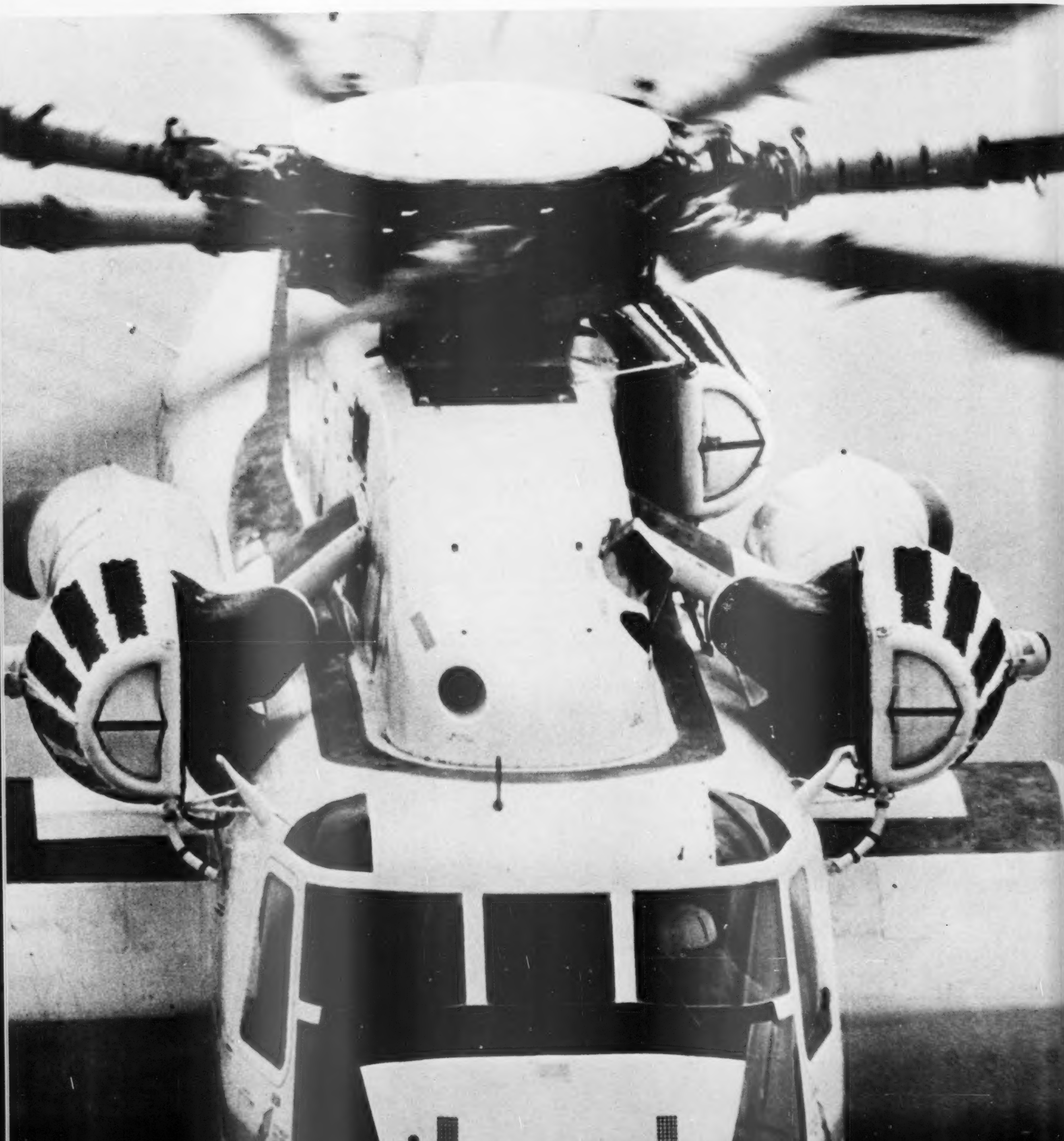
This article was prompted by an excellent hazard report submitted by a NAVAIRLANT A-7 squadron, which chronicled one misadventure in the day of a junior aviator. This gent made a few bad decisions during a landing at the end of a long day —a delayed decel on a long, damp runway, and an attempted high-speed turnoff when he ran out of concrete. He didn't make it, but fortunately the damage was limited to a blown tire. In the hazard report, his commanding officer's comments were right on the mark, and included this cogent excerpt: ". . . the highest workload of this pilot's day took place at the end of it. It is to avoid this circumstance that crew rest criteria are established. . ."

It's a really compelling argument, isn't it? It takes maximum concentration to properly analyze all factors that can affect you during any landing, especially that last one of the day or night. You have to be ready. ◄

Cdr. Mulvany is the A-7 analyst at the Naval Safety Center. His flying experience includes tours in VA 72, VA 174 and VA 46. He has over 2,300 hours in A-7A/B/E and TA-7C aircraft, and is current in the A-7E.

The Hot Seat

By Capt. A.R. Kooistra, USMC



. . . The turn is initiated and suddenly a frantic call (two actually) for power. *The collective is "cleaned and jerked" with the radar altimeter passing through 50 feet . . .*

BLUE water ops. Finally! After all the turmoil of the workups, embarkation and the "family" matters to settle, it is a relief to finally be underway. Well, we all know what that means — carrier qualifications! By this point everyone is coming aboard fairly well during the day. That still leaves **night** CQs. Anyone who says that they enjoy blue water, no moon, no horizon CQs needs to report to the local substance abuse representative for testing.

How about you schedule writers? Let's see — take the strongest HAC who has done the most recent night CQs and stick him in the left seat and then line up everyone else for.5-hour windows. Everyone gets his five bounces and we're all heroes.

How about the starting lineup? The newest H2Ps can get theirs during field grade darkness (pink time) and then finish up with the HACs in ascending order of experience. So far so good, right? I mean, is there any other safe or sane way to do it? You wouldn't want to reverse the order and leave the newer guys with a HAC who, by this point, would probably rather be (and should be) into his third beer. As predicted, the schedule writer wins, the Ops O smiles and the CO signs the schedule.

A standard boat brief is conducted and hot seat times given. The launch goes and darkness sets in. Meanwhile, back in the ready room, Pri-fly calls and everyone in turn proceeds out into the passageway and up onto the flight deck. Finally it's your turn, the cleanup man. No sweat, "Steve Canyon" can sleep in the left seat because "Chuck Yeager" is about to board. Put on the old helmet and vest and make your way toward the flight deck. Those darn white passage lights and (you thought the Navy was serious about light discipline). Stumble up the ladder (at least the red lights are on in the ladder well), open up the hatch and step onto the roof. You curse as you hit something — you think it was a tow tractor —and make your way to the red glow emanating from your cockpit.

The deck is rolling about five to seven degrees with a 17-knot wind about 30 degrees starboard. The LSE signals, you make your way into the aircraft and strap into the right seat. In the left seat Steven is finishing his "state and souls" call just as you connect the short cord to your helmet. "OK, you've got it. Let's go."

Take a quick look at the gauges, check the LSE and pull into a hover. Another quick check inside, and off you go. Switch to the gauges and get the scan going. Fighting the eyes for a proper scan, three other aircraft in the pattern, one abeam for the break, the radio is clobbered and the call comes to take interval with the break traffic. Steve takes the controls and pulls hard to the right to align the aircraft with the break traffic. You are still on the gauges and fighting. You get the controls back and finally reach abeam. The instrument lights aren't just right, but so what; you can adjust them once aboard. Make the abeam call and you are cleared in to land.

The turn is initiated and suddenly a frantic call (two actually) for *power*.The collective is "cleaned and jerked" with the radar altimeter passing through 50 feet. Finally you get aboard and sit trying to figure out what happened. Steve feels like he's lost a few years off his life. The ship reported a sonar contact and even though you didn't become "skipper" or a submersible, you were able to report that home plate's hull **did** need cleaning. How could this happen to you?

Let's back up and see how many links there were in this potential mishap chain. This is the chance for all you Laz-E-Boy Joe Namaths.

How about the ready room and passageways? All of those lights sure don't do much for the night vision (Night Vision and The Aviator — Lt. R.J. Seymore USN, MC, Approach, April 1985).

How about the rapidity in which the transition is made from one environment to another (ready room to controls)? Maybe a once-around the pattern would be more appropriate. What? Are you kidding? With good old Steve and Chuck in there? After all, we are the "A" team. Well, sports fans, especially because of that. In certain instances the most dangerous aircrew situation exists when flying HAC to HAC. You simply trust too much and don't want to tread on sensitive egos.

I suppose that the final link comes from the cockpit lighting. No secondary floods were used to prevent hindering vision, and upon close inspection the gauge lights in the VSI and airspeed indicator were marginal at best. Thus, during the most critical phase of the pattern (off the 180 position), you allowed these two critically important instruments to drop from your already shaky scan.

How about some lessons learned for your Steves and Chucks out there. First, protect your vision. Stay out of bright light and use sunglasses. People may think you are auditioning for the "Blues Brothers," but it is better that than

a starring role as a sinking skipper.

When you strap in, check your instruments — all of them — for adequate and *uniform* illumination. Don't let anyone rush you. Finally, if you are uncomfortable, let the left-seater fly one as you get your scan working. I'm sure the scenario just described is not new and I hope these few words will keep you from connecting the links in the mishap chain like Steve and Chuck almost did.

(Some squadrons prohibit hot-seat evolutions, day or night, according to Maj. J.T. Hill, Naval Safety Center assault helo analyst. This increases scan adjustment time for the oncoming pilot and eliminates the possibility of inadvertent control movements caused by the pilots climbing in or out of the cockpit. Ships and squadron ops, however, don't like the "no hot-seat rule" because of increased deck time and scheduling required to complete CQ evolutions. Maj. Hill also had a few words about the ship lighting discussed in the article, noting "don't blame the Navy for white passage lights being on in aviation spaces during night ops . . . those switches are readily accessible, and a good squadron ops department ensures they are 'red' at night." Current regulations require that ships with sodium vapor deck lights must use them in night evolutions, he said. LPH and LHAs use them for night ops, and they don't harm night adaptation).

Capt. Kooistra is a CH-53E pilot currently flying CH-53Ds with HMM-163(C) while deployed aboard USS *Peleliu* (LPH 5) in WESTPAC. He is the squadron quality assurance officer and a graduate of the aviation safety officers course at the Naval Postgraduate School Monterey, Calif., and the Army Aviation Safety School at the U.S. Army Aviation Center, Fort Rucker, Ala.

THX KXY

Xvxn though our typxwritxr is an old modxl it works quitx wxll xxcxpt for onx of thx kxys. It is trux that thxrx arx forty kxys that function wxll xnough, but just onx kxy not working makxs all thx diffxrxncx.

Somxtimxs it sxxms our naval aviation txam is rathxr likx this typxwritxr – not all thx kxy pxoplx arx working propxrly.

You may say to yoursxlf, "Wxll, I am only onx pxrson, I won't makx or brxak it," but it doxs makx a diffxrxncx bxcausx a txam rxquirxs thx participation of xvxry pxrson to bx xffxctivx.

So thx nxxt timx you think you arx only onx pxrson and that your xfforts arx not nxxdxd, rxmxmbxr our typxwritxr.

RAAF Flight Safety Review

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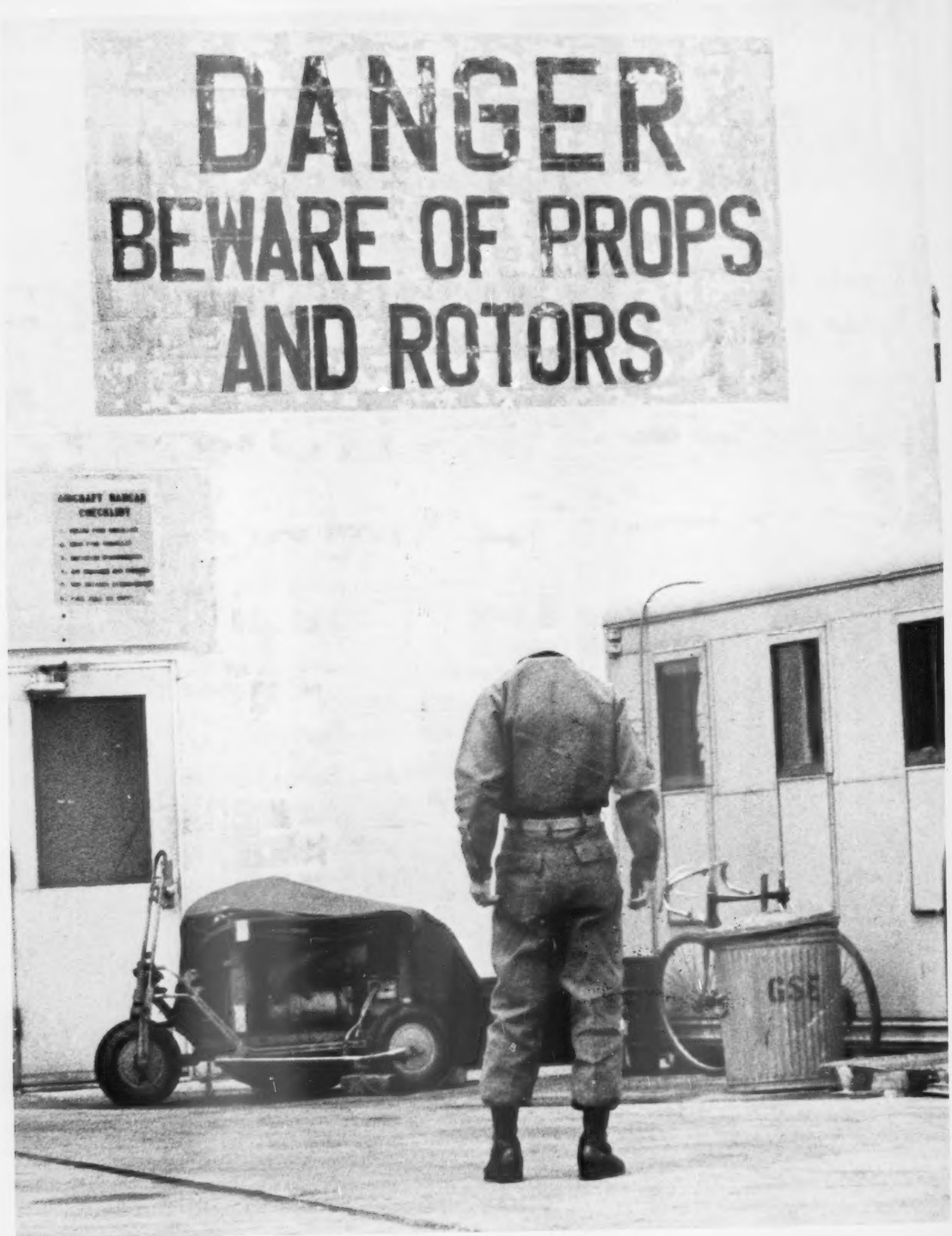
DANGER
BEWARE OF PROPS
AND ROTORS
GSE